

Case report

Circular saw suicide

O. Judd MRCS, J.P. Wyatt FRCS, MD (Consultant in Accident and Emergency) *

Department of Accident and Emergency, Royal Cornwall Hospital, Treliske, Truro TR1 3LJ, UK

Received 24 March 2006; received in revised form 17 June 2006; accepted 24 June 2006

Available online 22 February 2007

Abstract

A case of an individual who died as a result of a self-inflicted circular saw injury to the head is presented. Death appeared to result from massive haemorrhage from injury to the superior sagittal sinus. The described mechanism of injury appears to be very unusual and may have reflected underlying issues. In particular, potential background factors resulting in the self-infliction of an injury to the head are discussed.

© 2006 Elsevier Ltd and FFLM. All rights reserved.

Keywords: Suicide; Head injury

1. Introduction

Head injury is extremely common: about a million patients attend Accident and Emergency departments each year with head injuries. These injuries may be broadly stratified using the Glasgow Coma Scale (GCS) according to their severity.¹ Eighty percent are classified as mild (GCS 13–15), 10% are moderate (GCS 9–12), and the remainder are severe (GCS 3–8).² Severe head injury is the most frequent cause of trauma related deaths.³ The majority of deaths from trauma in the UK reflect unintentional events (“accidents”), but a significant minority follow suicide and an even smaller proportion (less than 10%) reflect homicide.⁴ Of deaths from suicide, self-inflicted head injury appears to be uncommon.⁵ Suicides and suicidal injuries using sharp power tools are rare and seldom reported in the medical literature. The following case is unique to the literature and outlines a death resulting from a self-inflicted head injury.

2. Case report

A 47 year old male was seen by his wife to go out of his house to his workshop, adjacent to his house, early in the morning. A bench-mounted circular saw was amongst other woodworking machinery fitted in the workshop. The saw was heard to be operating. His wife found him a short time later. He was severely injured, bleeding profusely and lying by the operating circular saw. She immediately alerted the emergency services. On arrival at the scene, the paramedics documented an estimated blood loss in excess of two litres from a severe head wound. He was breathing and had a pulse, but was unconscious.

By the time he arrived at the Accident and Emergency department he had lost his pulse. An impression was made of penetrating head injury with direct brain injury and hypovolaemia. He received three litres of IV crystalloid and two units of O negative blood but cardiac arrest continued with pulseless electrical activity. Attempts at resuscitation were unsuccessful and he was certified dead.

He had a revealing past history. He had resigned from his job as workshop technician a year earlier due to poor working conditions and complaints of recurrent severe headaches. It was alleged he suffered carbon monoxide poisoning at work but a civil claim in this regard was started but not pursued. Since then he had become depressed and had a very recent history of attempted suicide by hanging.

* Corresponding author. Tel.: +44 1872 252452; fax: +44 1872 253215.
E-mail address: jonathan.wyatt@rcht.cornwall.nhs.uk (J.P. Wyatt).

From the evidence on this occasion, it appeared that he had apparently placed his head purposefully on the rotating saw blade. He must have applied some degree of force, pushing his head into the blade as he sustained a deep linear wound. Post-mortem examination revealed a 120 mm long full-thickness scalp wound from the forehead to the middle of the scalp. Beneath was a 110 × 4 mm full-thickness lesion through the skull extending into the superior sagittal sinus. The lesion extended deeply through the dura-mata and into the left frontal lobe. A significant amount of cerebral matter was missing. The conclusion of the coroner in this case was suicide by intentional self-inflicted head injury.

3. Discussion

Forensic specialists are not infrequently involved in the investigation of traumatic deaths where the mechanism of injury appears to be bizarre. Although initial impressions gained from an examination of the injury scene and from the nature of the injuries sustained may lead to a suspicion of alternative explanations, the possibility of self-inflicted injury needs to be considered. A wide range of self-inflicted injuries have been reported, but self-inflicted brain injury is relatively uncommon, both in terms of the overall number of head injuries and deaths from suicide.⁶ With a past history of suicidal ideation and previous suicide attempts, this patient was clearly at risk of suicide.

Suicide using circular or band saw is unusual, with only a few cases reported in the literature. Most are the result of limb amputations⁷ or neck wounds.^{7–9} One case describes an episode very similar to the one in this case, involving the use of a circular saw to the head in a suicide attempt. However, due to a deviation in the position of the superior sagittal sinus and a hesitation, the patient's life was saved by medical intervention and neurosurgery.⁸ Case reports also exist of patients with known psychiatric disorders having used power tools to the head, and have spared the sagittal sinus. These patients died from central brain dysfunction rather than exsanguination which appeared to be the primary problem in the case we present.⁸ Also intriguing in our case was the past history of a chronic headache and possible chronic carbon monoxide poisoning.

It is accepted that chronic severe headache can pre-dispose to depression and chronic psychological imbalance.¹⁰ Indeed, cluster headaches are colloquially known as 'suicide headaches' on account of the extreme severe pain that characterises attacks.¹¹ Patients can exhibit strange and stereotypical behaviours during attacks, sometimes in a repetitive manner. These may include restlessness, moaning, screaming and in some cases violent and self-harming behaviour.¹² Head-banging may occur in an apparently vain attempt to relieve the severe pain. It is possible that the patient in our report inflicted a head injury upon himself as a result of and directed towards the site of his severe headache. Chronic headache, and specifically migraine, is also associated with mental disorders. Anxiety, depression

and indeed suicidal behaviour are seen at an increased lifetime risk in those with migraine.^{13–15}

Given the history, we speculate that the actions of the patient in the case we present might reflect neuropsychiatric complications of chronic carbon monoxide poisoning. The symptoms of chronic carbon monoxide poisoning are typically insidious at onset, but the most overt symptom is chronic headache.¹⁶ Headache is most frequently frontal and is commonly throbbing and continuous.¹⁷ Chronic exposure to low levels of carbon monoxide can also cause psychological effects, ranging from subtle behavioural disturbance to overt psychosis.^{16,18} Depression is common, alongside chronic fatigue, apathy and mental confusion.¹⁹ Data from previous research suggests that the mode of suicide reflects the underlying condition and in particular, that more violent modes of suicide are associated with psychotic illness.²⁰ It is possible that the patient in our report was suffering from a psychotic episode, which may (or may not) have been related to chronic carbon monoxide exposure. Unfortunately, there is no way to verify this.

4. Conclusion

Those responsible for the investigation into deaths involving unusual mechanisms need to consider all background factors. There are many potential aetiological mechanisms to consider in this case. It is not possible to be certain as to the extent to which each might have been responsible. The unusual events resulting in suicide may have reflected one or more of the following: carbon monoxide exposure, chronic headaches from another cause or a primary psychiatric disorder.

References

- Jennett B, Macmillan R. Epidemiology of head injury. *BMJ* 1981;**282**:101–4.
- Rimel RW, Giordani B, Barth JT, Boll TJ, Jane JA. Disability caused by minor head injury. *Neurosurgery* 1981;**9**:221–8.
- Surras ME, Narayan RK. Head injury. In: Grossman RG, Loftus CM, editors. *Principles of neurosurgery*. 2nd ed. Philadelphia: Lippincott-Raven; 1999. p. 117–70.
- Wyatt J, Beard D, Gray A, Busuttill A, Robertson C. The time of death after trauma. *BMJ* 1995;**310**:1502.
- National Mortality statistics for UK 2003. Available from www.statistics.gov.uk.
- Thurman DJ, Alverson C, Dunn KA, Guerrero J, Snizek JE. Traumatic brain injury in the United States: a public health perspective. *J Head Trauma Rehabil* 1999;**14**(6):602–15.
- Betz P, Eisenmenger W. Unusual suicides with electric saws. *Forensic Sci Int* 1995;**75**:173–9.
- Rainov NG, Burkert WL. An unusual suicide attempt using a circular saw. *Int J Legal Med* 1994;**106**(4):223–4.
- Clark SP et al. Suicide by band saw. *Amer J For Med Path* 1989;**10**(4):332–4.
- Peterlin BL, Ward TN. Neuropsychiatric aspects of migraine. *Curr Psychiatry Rep* 2005;**7**(5):371–5.
- Torelli P, Manzoni GC. Pain and behaviour in cluster headache. *Funct Neurol* 2003;**18**(4):205–10.
- Torelli P, Manzoni GC. Behaviour during cluster headache. *Curr Pain Headache Rep* 2005;**9**(2):113–9.

13. Guillem E, Pelissolo A, Lepine JP. Mental disorders and migraine. *Encephale* 1999;**25**(5):436–42.
14. Breslau N, Davis GC. Migraine, physical health and psychiatric disorder. *J Psych Res* 1993;**27**(2):211–21.
15. Breslau N. Migraine, suicidal ideation, and suicide attempts. *Neurology* 1992;**42**(2):392–5.
16. Raub JA et al. Carbon monoxide poisoning – a public health perspective. *Toxicology* 2000;**145**(1):1–14.
17. Hampson NB, Hampson LA. Characteristics of headache associated with carbon monoxide poisoning. *Headache* 2002;**42**(3):220–3.
18. Candura SM et al. Occupational poisoning and psychiatric manifestations. *G Ital Med Lav Ergon* 2000;**22**(1):52–63.
19. Knobloch L, Jackson R. Recognition of chronic carbon monoxide poisoning. *WMJ* 1999;**98**(6):26–9.
20. Wyatt JP, Beale JP, Graham CA, Beard D, Busuttil A. Suicidal high falls. *J Clin Forensic Med* 2000;**7**:1–5.